# JOURNAL OF MAMMALOGY

ELMER C. BIRNEY, *Managing Editor*

DON E. WILSON, *Journal Editor*

MICHAEL A. BOGAN, *Associate Editor*

RICHARD E. MACMILLEN, *Associate Editor*

B. J. VERTS, *Associate Editor*

JAMES L. PATTON, *Editor for Reviews*

JAMES S. MELLETT, *Editor for Advertising*

VOLUME 61

PUBLISHED QUARTERLY

BY THE

AMERICAN SOCIETY OF MAMMALOGISTS

1980

# The American Society of Mammalogists

**Founded 3 April 1919, incorporated 29 April 1920**


*Officers*

JAMES S. FINDLEY, *President*
J. MARY TAYLOR, *First Vice-President*
TERRY A. VAUGHAN, *Second Vice-President*
JERRY R. CHOATE, *Recording Secretary*
GORDON L. KIRKLAND, JR., *Secretary-Treasurer*
ELMER C. BIRNEY, *Managing Editor*

*Additional Directors*

| 1978–1981 | 1979–1982 | 1980–1983 |
|---|---|---|
| HUGH H. GENOWAYS | ROBERT J. BAKER | JAMES H. BROWN |
| JAMES L. PATTON | MURRAY JOHNSON | JOHN F. EISENBERG |
| DAVID J. SCHMIDLY | B. J. VERTS | KARL F. KOOPMAN |
| MICHAEL H. SMITH | BERNARDO VILLA-R. | MARIE A. LAWRENCE |
| JOHN O. WHITAKER, JR. | DON E. WILSON | DUANE A. SCHLITTER |

*Living Past Presidents*

| | | |
|---|---|---|
| E. RAYMOND HALL | EMMET T. HOOPER | J. KNOX JONES, JR. |
| WILLIAM J. HAMILTON, JR. | DONALD F. HOFFMEISTER | SYDNEY ANDERSON |
| WILLIAM H. BURT | RANDOLPH L. PETERSON | WILLIAM Z. LIDICKER, JR. |
| WILLIAM B. DAVIS | RICHARD G. VAN GELDER | ROBERT S. HOFFMANN |
| ROBERT T. ORR | JAMES N. LAYNE | |

*Trustees*

OLIVER P. PEARSON (1981), *Chairman*

EDGAR N. STONE (1982) PHILIP L. WRIGHT (1983)


## The Journal of Mammalogy


ELMER C. BIRNEY, *Managing Editor*, Bell Museum of Natural History, University of Minnesota, Minneapolis, MN 55455

DON E. WILSON, *Journal Editor*, National Fish and Wildlife Laboratory, National Museum of Natural History, Washington, DC 20560 (**Direct all manuscripts to the Journal Editor.**)

MICHAEL A. BOGAN, *Associate Editor*, National Fish and Wildlife Laboratory, National Museum of Natural History, Washington, DC 20560

GUY N. CAMERON, *Associate Editor*, Department of Biology, University of Houston, Houston, TX 77004

B. J. VERTS, *Associate Editor*, Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR 97331

JAMES L. PATTON, *Editor for Reviews*, Museum of Vertebrate Zoology, University of California, Berkeley, CA 94720

JAMES S. MELLETT, *Editor for Advertising*, Department of Biology, 952 Brown Building, New York University, New York, NY 10003



Journal of Mammalogy (ISSN 0022-2372) is published quarterly by the American Society of Mammalogists, 1041 New Hampshire Street, Lawrence, Kansas 66044.

Manuscripts for publication, books for review, and papers for special comment should be sent to the appropriate editor as explained in "Publication Policies and Suggestions for Authors" in the back of the first number of this volume.

Publications for inclusion in the bibliography of mammalogical literature, section on "Recent Literature," should be sent to Marie A. Lawrence, Department of Mammalogy, American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024.

SECOND-CLASS POSTAGE PAID AT LAWRENCE, KANSAS, U.S.A. 66044
ALLEN PRESS, INC., LAWRENCE, KANSAS, USA



© 1980 The American Society of Mammalogists

# CONTENTS OF VOLUME 61

## NUMBER 1


Survival and longevity of the little brown bat (*Myotis lucifugus*) in southeastern Ontario ---- *Robert Keen* and *Harold B. Hitchcock* 1

Activity of black bears in the Great Smoky Mountains National Park ---- *David L. Garshelis* and *Michael R. Pelton* 8

Foraging and day-roosting dynamics of canopy fruit bats in Panama ---- *Douglas W. Morrison* 20

Pinna temperature in exercising jackrabbits, *Lepus californicus* ---- *Richard W. Hill, Donald P. Christian,* and *James H. Veghte* 30

Genetic variability and domestication in swine ---- *Michael W. Smith, Michael H. Smith,* and *I. Lehr Brisbin, Jr.* 39

Late Pleistocene horses of Dry Cave, Eddy County, New Mexico ---- *Arthur H. Harris* and *Linda S. W. Porter* 46

Systematic relationships of woodland and prairie forms of the common shrew, *Sorex cinereus cinereus* Kerr and *S. c. haydeni* Baird, in the Canadian prairie provinces ---- *C. G. van Zyll de Jong* 66

Systematics and evolution of the pygmy shrews (subgenus *Microsorex*) of North America ---- *Victor E. Diersing* 76


General Notes


Feeding behavior of the white-winged vampire bat, *Diaemus youngii*, on poultry ---- *Ivan Sazima* and *Wilson Uieda* 102

Shifts in times of activity by *Lasionycteris noctivagans* ---- *Charles C. Reith* 104

Non-Robertsonian chromosomal variation in *Microtus montanus* ---- *Steven R. Judd, Stephen P. Cross,* and *Sen Pathak* 109

Social interaction and spatial distribution in a desert rodent ---- *Michael H. Smith, Bernardo G. Maza,* and *James G. Wiener* 113

Nocturnal activity patterns of feral ponies ---- *Ronald R. Keiper* and *Michael A. Keenan* 116

Opportunistic feeding by two species of *Myotis* ---- *Terry A. Vaughan* 118

Feeding activity of the Japanese lesser horseshoe bat, *Rhinolophus cornutus cornutus*, during the hibernation period ---- *Kimitake Funakoshi* and *Teru Aki Uchida* 119

The importance of arthropods in the diet of *Zapus princeps* in a subalpine habitat ---- *Terry A. Vaughan* and *Wendy Pearse Weil* 122

Altitudinal variation in emergence time of golden-mantled ground squirrels (*Spermophilus lateralis*) ---- *Michael T. Bronson* 124

Observations of interspecific behavior between predators and white-tailed deer in southwestern Oklahoma ---- *Gerald W. Garner* and *John A. Morrison* 126

Evoked brain potentials demonstrate hearing in a manatee (*Trichechus inunguis*) ---- *Theodore H. Bullock, Daryl P. Domning,* and *Robin C. Best* 130

Corticosteroid release by adrenal tissue of Alaskan snowshoe hares in a year of population decline ---- *Dale D. Feist* 134

Ingestion of soil by hispid cotton rats, white-footed mice, and eastern chipmunks ---- *Charles T. Garten, Jr.* 136

Experimental food preferences of two southern Chilean rodents ---- *R. Murúa, L. A. Gonzalez,* and *C. Jofre* 138

Vertical nesting distribution of two species of *Peromyscus* under experimental conditions ---- *Christine D. Stah* 141

Age of first leaving the nest in two species of deer mice (*Peromyscus*) ---- *Bedford M. Vestal, William C. Coleman,* and *Penn R. Chu* 143

Sexual dimorphism for body mass in 13 taxa of muroid rodents under laboratory conditions ---- *Donald A. Dewsbury, Denis J. Baumgardner, Robert L. Evans,* and *Daniel G. Webster* 146

Accuracy of scent-mark identification for free-ranging dogs ---- *Marc Bekoff* 150

A break-away expandable collar for cervids ---- *William D. Steigers, Jr.* and *Jerran T. Flinders* 150

A simple, low-cost timing device for mammal traps ---- *Philip C. Withers* and *K. Achleitner* 153

Notes on interactions between the tayra (*Eira barbara*) and the white-fronted capuchin (*Cebus albifrons*) ---- *Thomas R. Defler* 156

Daytime resting sites of two Adirondack pine martens ---- *Raymond D. Masters* 157

*Peromyscus beckensis* Dalquest referred to the genus *Symmetrodontomys* ---- *Walter W. Dalquest* 157

*Aproteles bulmerae* (Chiroptera: Pteropodidae) of New Guinea is not extinct ---- *D. Hyndman* and *J. I. Menzies* 159

A specimen of *Felis concolor coryi* from Florida ---- *Robert C. Belden* and *Donald J. Forrester* 160

A recent record of the swift fox (*Vulpes velox*) in Montana ---- *Robert E. Moore* and *Neil S. Martin* 161

The southeastern shrew, *Sorex longirostris*, in southern Indiana ---- *Robert K. Rose* 162

Body weights and dimensions of adult female Australian sea lions, *Neophoca cinerea* ---- *Gregory E. Walker* and *John K. Ling* 164


Reviews


Biology of bats, edited by William A. Wimsatt ---- *Stephen R. Humphrey* 166

Ecology of the forest hog (*Hylochoerus meinertzhageni* Thomas) in Virunga National Park, by J. P. D'Huart ---- *Reginald H. Barrett* 167

Behavioural ecology: an evolutionary approach, edited by J. R. Krebs and N. B. Davies ---- *Harry W. Greene* 168

The handbook of British mammals, 2nd edition, edited by G. B. Corbet and H. N. Southern ---- *R. J. Berry* 169

Comments and News ---- 171

## NUMBER 2


Primates from later Eocene rocks of southern California ..... *Jason A. Lillegraven* 181
Behavioral ecology of an insular woodrat .. *Terry A. Vaughan* and *Steven T. Schwartz* 205
Social factors influencing delayed reproductive maturation in prairie deermice (*Peromyscus maniculatus bairdii*) in laboratory populations ..... *C. Richard Terman* 219
Demographic and reproductive parameters of the yellow-cheeked pocket gopher (*Pappogeomys castanops*) .. *Michael J. Smolen, Hugh H. Genoways,* and *Robert J. Baker* 224
Litter size in Columbian ground squirrels (*Spermophilus columbianus*) ..... *Jan O. Murie, David A. Boag,* and *V. Keith Kivett* 237
Clustering behavior of hibernating *Myotis sodalis* in Missouri ..... .. *Richard L. Clawson, Richard K. LaVal, Margaret L. LaVal,* and *William Caire* 245
Feeding ecology of central Chilean foxes, *Dusicyon culpaeus* and *Dusicyon griseus* ..... *Fabian M Jaksić, Roberto P. Schlatter,* and *José L. Yáñez* 254
Age, sex, reproduction, and spatial organization of lynxes colonizing northeastern Minnesota ..... *L. David Mech* 261
Insulation, radiation, and convection in small arctic mammals ..... *Mark A. Chappell* 268
Thermal energetics and thermoregulatory costs of small arctic mammals ..... *Mark A. Chappell* 278
Orientation to landmarks within the preferred habitat by *Peromyscus leucopus* ..... *Ronald E. Barry, Jr.,* and *Edward N. Francq* 292


### General Notes


The genetic structure of an isolated population of *Sigmodon hispidus* from the lower Colorado River Valley ..... *Leroy R. McClenaghan, Jr.* 304
Malaria as a possible selective factor in the speciation of macaques ..... *Bruce P. Wheatley* 307
Intraspecific morphologic variation in Ord's kangaroo rat, *Dipodomys ordii*, from Oklahoma ..... *Michael L. Kennedy, Melvin L. Beck,* and *Troy L. Best* 311
Evolutionary origin of *Eptesicus lynni* ..... *Michael L. Arnold, R. J. Baker,* and *H. H. Genoways* 319
Karyotype of *Mystacina tuberculata* (Chiroptera: Mystacinidae) .. *J. W. Bickham, M. J. Daniel,* and *M. W. Haiduk* 322
Inheritance of coat color and changes in pelage coloration in black bears in northeastern Minnesota ..... *Lynn L. Rogers* 324
Prey selection by a Neotropical foliage-gleaning bat, *Micronycteris megalotis* ..... *Richard K. LaVal* and *Margaret L. LaVal* 327
Diet of the little hairy armadillo, *Chaetophractus vellerosus*, of northwestern Argentina .. *David H. Greegor, Jr.* 331
Preliminary study of movements and home range of the armadillo, *Chaetophractus vellerosus* ..... *David H. Greegor, Jr.* 334
Parturition and social interaction among captive vampire bats, *Desmodus rotundus* ..... *Richard S. Mills* 336
Sexual solicitation of subordinate males by female tassel-eared squirrels (*Sciurus aberti*) .. *R. C. Farentinos* 337
Seasonal change in the aggressive behavior of *Peromyscus maniculatus* inhabiting a pinyon-juniper woodland in western Nevada ..... *Jeffrey B. Llewellyn* 341
Notes on the yellow-tailed woolly monkey (*Lagothrix flavicauda*) of Perú ..... *Gary R. Graves* and *John P. O'Neill* 345
Observations on Mohave ground squirrels, *Spermophilus mohavensis*, in Inyo County, California ..... *Richard Zembal* and *Cynthia Gall* 347
Swarming, reproduction, and early hibernation of *Myotis lucifugus* and *M. volans* in Alberta, Canada ..... *David B. Schowalter* 350
Copulatory plugs in ground squirrels ..... *J. O. Murie* and *I. G. McLean* 355
Morphometrics, parasites, and chlorinated hydrocarbon residues of pygmy killer whales from Florida ..... *Donald J. Forrester, Daniel K. Odell, Neal P. Thompson,* and *Jesse R. White* 356
Relationship between relative brain size and climbing ability in *Peromyscus* ..... *Cliff Lemen* 360
*Eutamias* growth rates: additional corrections ..... *Thomas P. O'Farrell* 364
Reingestion of feces by *Microtus pennsylvanicus* ..... *D. E. Ouellette* and *J. F. Heisinger* 366
Activity patterns of captive Reeve's muntjacs (*Muntiacus reevesi*) ..... *Richard H. Yahner* 368
Aerial predation on Wyoming ground squirrels ..... *Sharon Pfeifer* 371
Fishing behavior of coyotes on the Columbia River, southcentral Washington ..... *Joseph Tucker Springer* 373
Cooperative predation by coyotes on badgers ..... *Anne Page Rathbun, Michael C. Wells,* and *Marc Bekoff* 375
Coyote–golden eagle interactions at an ungulate carcass ..... *W. Don Bowen* 376
Surplus-killing by coyotes ..... *William F. Andelt, Donald P. Althoff, Ronald M. Case,* and *Philip S. Gipson* 377
Analysis of sonagrams of American bison (*Bison bison*) ..... *Harvey L. Gunderson* and *Brian R. Mahan* 379
Snake predation on *Marmosa noctivaga* ..... *Paul E. Gertler* and *Jorge Morales* 381


### Reviews


The biology of the monotremes, by Mervyn Griffiths ..... *J. Mary Taylor* 382
Ecology and taxonomy of African small mammals, edited by Duane A. Schlitter ..... *J. Meester* 383
The biology and conservation of the Callitrichidae, edited by D. G. Kleiman ..... *John Terborgh* 384
The study of prosimian behavior, edited by G. A. Doyle and R. D. Martin ..... *Thelma Rowell* 386
Evolutionary principles of the mammalian middle ear. Advances in anatomy, embryology and cell biology, by G. Fleischer ..... *Douglas M. Lay* 388

Comments and News ..... 390

## NUMBER 3


A new genus of murid rodent from the Komodo Islands in Nusatenggara, Indonesia ---- *Guy G. Musser* and *Boeadi* 395

Chromosome numbers and systematic relations in the genus *Thomomys* (Rodentia: Geomyidae) ---- *Charles S. Thaeler, Jr.* 414

Linkage and selection analysis of biochemical variants in *Peromyscus maniculatus* ---- *R. Baccus, J. Joule,* and *W. J. Kimberling* 423

Geographic variation analysis of *Dipodomys ordii* using nonmetric cranial traits ---- *Steve E. Hartman* 436

A new species of *Palaeosinopa* (Insectivora: Pantolestidae) from the late Paleocene of western North America ---- *Philip D. Gingerich* 449

A new subspecies of *Eutamias quadrivittatus* (Rodentia: Sciuridae) from the Organ Mountains, New Mexico ---- *Bruce D. Patterson* 455

Field metabolic rate, water flux, and food consumption in three-toed sloths (*Bradypus variegatus*) ---- *Kenneth A. Nagy* and *G. Gene Montgomery* 465

Population structure as a predictor of spatial association between *Sigmodon hispidus* and *Microtus ochrogaster* ---- *Gregory E. Glass* and *Norman A. Slade* 473

Pitfall versus live-trap enumeration of fluctuating populations of *Microtus townsendii* ---- *Terry D. Beacham* and *Charles J. Krebs* 486

Herbivorous mammals along a montane sere: community structure and energetics ---- *Douglas C. Andersen, James A. MacMahon,* and *Michael L. Wolfe* 500

Early olfactory determinants of adult responsiveness to social status odors in *Mus musculus* ---- *David F. Hennessy* 520


### General Notes


Evidence for the use of a scent post by *Myotis lucifugus* ---- *E. R. Buchler* 525

A possible case of interspecific transmission of rabies in insectivorous bats ---- *Gary P. Bell* 528

Estrous and gestation periods in Richardson's ground squirrels ---- *Gail R. Michener* 531

Notes on the breeding biology of thick-tailed and silvery galagos in captivity ---- *Robert H. Eaglen* and *Elwyn L. Simons* 534

A pseudohermaphroditic XY/XO mosaic *Pseudomys australis* (Rodentia: Muridae) ---- *W. G. Breed, P. R. Baverstock, M. Gelder,* and *A. Jahnke* 537

Foods eaten by some bats from Costa Rica and Panama ---- *John O. Whitaker, Jr.,* and *James S. Findley* 540

Feeding position preference in manatees (*Trichechus*) ---- *Daryl P. Domning* 544

Age determination in African elephants ---- *L. P. Fatti, G. L. Smuts, A. M. Starfield,* and *A. A. Spurdle* 547

Survival of large and small adults in fluctuating populations of *Microtus townsendii* ---- *Terry D. Beacham* 551

Effects of food availability on trap response of the hispid cotton rat, *Sigmodon hispidus* ---- *William R. Teska* 555

Effects of some different land management practices on small mammal populations ---- *Timothy D. Reynolds* 558

An eye-lens weight curve for determining age in *Microtus pennsylvanicus* ---- *Robin E. Thomas* and *Edward D. Bellis* 561

The status of banner-tailed kangaroo rats, genus *Dipodomys*, from central Mexico ---- *John O. Matson* 563

Mammals collected by the Menage Scientific Expedition to the Philippine Islands and Borneo, 1890–1893 ---- *Robert M. Timm* and *Elmer C. Birney* 566

A black-footed ferret from Kansas ---- *Edward K. Boggess, F. Robert Henderson,* and *Jerry R. Choate* 571

The snow vole, *Microtus nivalis*, in the lowlands of western Yugoslavia ---- *J. Knox Jones, Jr.,* and *Dilford C. Carter* 572

Comparative energetics in two sympatric species of *Peromyscus* ---- *Walter S. Mazen* and *Robert L. Rudd* 573

Twinning in a California sea otter ---- *Thomas D. Williams, James A. Mattison,* and *Jack A. Ames* 575


### Reviews


Ecology and behavior of the manatee (*Trichechus manatus*) in Florida, by D. Hartman ---- *Colin Barnett* 577

Review of locomotor morphology of the vampire bat, *Desmodus rotundus*, by J. Scott Altenbach ---- *Timothy Strickler* 579

Handbuch der Säugetiere Europas. Band 1, Rodentia I (Sciuridae, Castoridae, Gliridae, Muridae), edited by J. Niethammer and F. Krapp ---- *Robert S. Hoffmann* 580

Mammals—their Latin names explained; a guide to animal classification, by A. F. Gotch ---- *George C. Steyskal* 581

Comments and News ---- 584

## Number 4


Spatial relationships of rodents in a sagebrush community ..... *Michael J. O'Farrell* 589
Energetics and the limits to a temperate distribution in armadillos ... *Brian K. McNab* 606
Daily metabolic patterns of short-tailed shrews (*Blarina*) in three natural seasonal temperature regimes ..... *J. C. Randolph* 628
Ecology, distribution, and food habits of spectacled bears, *Tremarctos ornatus*, in Perú ..... *Bernard Peyton* 639
Environmental relationships and the denning period of black bears in Tennessee ..... *Kenneth G. Johnson* and *Michael R. Pelton* 653
Home range size in eastern chipmunks, *Tamias striatus*, as a function of number of captures: statistical biases of inadequate sampling ..... *Michael A. Mares, Michael R. Willig,* and *Nancy A. Bitar* 661
Neonatal growth of northwest Atlantic harp seals, *Pagophilus groenlandicus* ..... *R. E. A. Stewart* and *D. M. Lavigne* 670
Relationships of pocket gopher (*Thomomys bottae*) populations of the lower Colorado River ..... *Margaret F. Smith* and *James L. Patton* 681
Genic variation in raccoons, *Procyon lotor* ..... *Roger D. Dew* and *Michael L. Kennedy* 697
Salivary amylase variation in *Peromyscus*: use in species identification ..... *Charles F. Aquadro* and *John C. Patton* 703


### General Notes


G- and C-band studies on the primitive karyotype for *Reithrodontomys* ..... *Lynn W. Robbins* and *Robert J. Baker* 708
C- and G-banded chromosomes of *Ammospermophilus insularis* (Rodentia: Sciuridae) ..... *J. T. Mascarello* and *Kathryn Bolles* 714
Hybrids of white-tailed and mule deer in Alberta ..... *William D. Wishart* 716
Maxillary dentition and new records of *Daphoenictis*, an Oligocene amphicyonid carnivore ..... *Robert J. Emry* and *Robert M. Hunt, Jr.* 720
*Arctodus pristinus* Leidy in the Pleistocene of Aguascalientes, Mexico ..... *Walter W. Dalquest* and *O. Mooser* 724
Observations on *Syntheosciurus*: taxonomy and behavior ..... *Robert K. Enders* 725
Colonization of suitable habitat by *Peromyscus leucopus* in coastal Maine ..... *Charles F. Aquadro, C. William Kilpatrick,* and *Kenneth L. Crowell* 727
Adaptive variation in diets of desert bats has implications for evolution of feeding strategies ..... *D. J. Howell* 730
Use of scatterhoards by eastern chipmunks to replace stolen food ..... *Lary Shaffer* 733
Feeding preferences of captive tassel-eared squirrels (*Sciurus aberti*) for ponderosa pine twigs ..... *Patrick J. Capretta, R. C. Farentinos, Vicki M. Littlefield,* and *Randall M. Potter* 734
The "chuck" sound of the nine-banded armadillo (*Dasypus novemcinctus*) ..... *Catherine Gremillion Christensen* and *George H. Waring* 737
Characteristic features of the underwater sounds of *Cephalorhynchus commersonii* ..... *William A. Watkins* and *William E. Schevill* 738
Alarm responses to raptors by rhesus monkeys at Cayo Santiago ..... *Bernard Chapais* and *Steven R. Schulman* 739
Possible functions of predator harassment in pronghorn antelopes ..... *Valerie E. Lipetz* and *Marc Bekoff* 741
Food caching by African wild dogs (*Lycaon pictus*) ..... *James R. Malcolm* 743
Effect of food consumption on water loss in *Myotis lucifugus* ..... *John E. Bassett* and *Jacob E. Wiebers* 744
Oxygen consumption in large spotted genets, *Genetta tigrina* ..... *Willard W. Hennemann III* and *Michael J. Konecny* 747
Fear bradycardia in free-ranging woodchucks, *Marmota monax* ..... *E. Norbert Smith* and *Robert A. Woodruff* 750
Seasonal occurrence and haul-out use in pinnipeds along Humboldt County, California ..... *Robert M. Sullivan* 754
Lifespan of Virginia meadow voles ..... *Robert K. Rose* and *Raymond D. Dueser* 760
Body condition, elemental balance, and parasitism in cotton rats ..... *Linda A. Briese* and *Michael H. Smith* 763
Effects of urine from conspecifics on sexual maturation in female prairie deermice, *Peromyscus maniculatus bairdii* ..... *Joseph R. Lombardi* and *J. Mel Whitsett* 766
The effect of crowding on the maturation of gonads in pine voles, *Microtus pinetorum* ..... *Margaret H. Schadler* 769
Mammalian prey digestibility by coyotes ..... *David Meriwether* and *Mark K. Johnson* 774
Breech presentation of the fetus in a pregnant muskox ..... *Christopher J. Norment* 776


### Reviews


Surki. Rasprostranenie i ekologiya. [Marmots. Distribution and ecology] edited by R. P. Zimina ..... *Robert S. Hoffmann* 778
Handbook of New Guinea rodents, by J. I. Menzies and E. Dennis ..... *William Z. Lidicker, Jr.* 779
Mammals of the eastern United States, second edition, by W. J. Hamilton, Jr., and J. O. Whitaker, Jr. ..... *Gordon L. Kirkland, Jr.* 780
The struggle for survival: the elephant problem, by John Hanks ..... *Jeheskel Shoshani* 782
The gibbons: songs of all species, recorded in their natural forest habitat, by Joe Marshall and Elsie Marshall ..... *John F. Eisenberg* 783

Annual Meeting ..... 784
Comments and News ..... 786
Index ..... 792